

L 14501-64 EWT(m) DLAAP/AFWL/SSD/ESD(t)
ACCESSION NR: AP4048631

S/0048/64/028/010/1578/1598

AUTHOR: Davydov, A.S.

TITLE: Collective excitation and deformability of nuclei /Report, Fourteenth Annual Conference on Nuclear Spectroscopy held in Tbilisi 14-22 Feb 1964/

SOURCE: AN SSSR. Izv. Seriya fizicheskaya, v.28, no.10, 1964, 1578-1598

TOPIC TAGS: nuclear physics, nuclear model, nuclear structure, excited state

ABSTRACT: This paper is a review of recent theoretical work on collective excitations of nuclei. Only those theories are discussed in which different nuclei are described independently. Most of the paper is devoted to even-even nuclei, in which single-particle and collective excitations can be clearly distinguished because of the large excitation energy of the former. The Hamiltonian for the even collective excitation of an even-even nucleus is written, and approximations employed by various authors are discussed briefly. Axially symmetric nuclei are discussed in some detail on the basis of a model in which the reciprocal rigidities of the nucleus with respect to axial and transverse vibrations appear as independent parameters. These parameters are found to be larger for near magic nuclei than for other nuclei;

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ACCESSION NR: AP4048631

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this corresponds to the weakened coupling between the outer nucleons and the doubly magic core in these nuclei. Spherical nuclei and nuclei without a symmetry axis are discussed briefly. Investigation of the first two excited states is not sufficient to determine whether or not a nucleus is spherical. A short section is devoted to electric monopole transitions, which involve a radial redistribution of charge. The theoretical probabilities for E0 transitions between spin 0 and spin 2 states are compared with experimental values for a number of nuclei. Such comparisons frequently make it possible to arrive at unambiguous spin assignments for excited states. The theory of almost doubly magic nuclei is still unsatisfactory. The spectra of these nuclei cannot be accounted for by quadrupole surface vibrations about a spherical shape. Further investigation is required, and it is suggested that a study of E0 and E2 transition probabilities may prove helpful. The last section of the paper is devoted to the model of an odd nucleus in which the odd nucleon is regarded as moving in the field of an ellipsoidal even-even core that executes surface vibrations. Mention is made of some interesting predictions, based on this model, that have not yet been tested experimentally. Orig.art.has: 42 formulas, 8 figures and 4 tables.

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L 14501-65
ACCESSION NR: AP4048631

ASSOCIATION: Kafedra kvantovoy teorii Moskovskogo gosudarstvennogo universiteta
(Quantum Theory Department, Moscow State University)

SUBMITTED: 00

ENCL: 00

SUB CODE: NP

NR REF SOV: 010

OTHER: 032

3/3

ACCESSION NR: AP4024573

S/0053/64/082/003/0393/0448

AUTHOR: Davy*dov, A. S.

TITLE: The theory of molecular excitons

SOURCE: Uspekhi fizicheskikh nauk, v. 82, no. 3, 1964, 393-448

TOPIC TAGS: molecular crystal, exciton, light transmission, fluorescence, absorption band, luminescence band, electric moment

ABSTRACT: The article is devoted to a theoretical description of the electronic excited states of molecular crystals and their manifestation in interaction with electromagnetic radiation. The analysis is limited to the quantum states of the crystal and their simplest experimental manifestations, without considering the transmission of a light wave through a crystal in its full scope. The theory is developed on the basis of the exciton concept and deals predominantly with the physical phenomena occurring in the unit cells when they

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ACCESSION NR: AP4024573

interact with light and other radiation. The section headings are: Introduction. 1. Exciton states in crystals having one molecule per unit cell. 2. Exciton states in crystals having several molecules per unit cell. 3. The specific electric moment of transition from the ground state of a crystal to the exciton state. 4. Use of group theory for a qualitative interpretation of the properties of exciton states. 5. Calculation of the resonance-interaction matrix. 6. Exciton and localized excitations in a crystal. 7. Experimental confirmation of the existence of exciton states in crystals. (A. The anthracene crystal. B. The naphthacene crystal. C. The naphthalene crystal. D. The benzene crystal.) 8. Exciton luminescence. (A. Luminescence of pure crystals. B. Luminescence of crystals containing impurities.) 9. Excitons in crystals of small thickness. 10. The form of absorption and luminescence bands due to localized excitations. Orig. art. has: 15 figures and 133 formulas.

ASSOCIATION: None

Card 2/3

ACCESSION NR: AP4024573

SUBMITTED: 00

DATE ACQ: 15Apr64

ENCL: 00

SUB CODE: SS, OP

NR REP SOV: 061

OTHER: 042

Card 3/3

L 15813-66 DWT(m) DIAAP

ACC NR: AP6001668

SOURCE CODE: UR/0053/65/087/004/0599/0614

AUTHOR: Davydov, A. S.

ORG: none

TITLE: Nuclear shape, deformability, and excited states

SOURCE: Uspekhi fizicheskikh nauk, v. 87, no. 4, 1965, 599-614

TOPIC TAGS: nuclear structure, excited nucleus, deformed nucleus, spheric nucleus, excited state

ABSTRACT: This is a review article dealing with recent developments in the study of the symmetry of the self-consistent field acting on the nucleons within the nucleus, which governs the nuclear shape and its deformability, and is a very important factor in the classification of single-nucleon and collective excited states. The relation between recent theories of nuclear deformations and rotational states in nonspherical nuclei are discussed briefly in the introduction in light of the most recent experimental data. This is followed by a

Card . 1/2

UDC: 539.142

L 15815-66

ACC NR: AP6003475

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stimulation of the exposed vagus nerve of cats showed that the compound exerts its hypotensive effect by blocking the vagal ganglion. This conclusion was further supported by the results of electrical stimulation of the preganglionic fibers of the sympathetic bundle of the neck. This does not exclude the participation of the central nervous system in the mechanism of action. Further studies revealed that the alkaloid has a curarelike effect on the nerve-muscle junction which may explain its general toxicity for animals. The compound has an inhibitory effect on peristalsis, reduces contracture (spasm) and is capable of preventing its development in excised portions of rabbit small intestine. The authors feel that these data can serve as the basis for further study of this preparation since they indicate it has a beneficial effect on the cardiovascular system.

SUB CODE: 06/

SUBM DATE: 03Nov63/

ORIG REF: 000/

OTH REF: 000

Card 2/2 *gc*

DAVYDOV, A.S., polkovnik; KORSHUNOV, V.N., polkovnik; KOZLOV, N.D., podpolkovnik; LUKANIN, Ye.A., polkovnik; NESIN, A.A., polkovnik; POZMOGOV, A.S., polkovnik; PUTINTSEV, A.I., podpolkovnik; SIDORENKOV, P.I., polkovnik; SYTOV, L.G., polkovnik; FEDIN, G.R., polkovnik; CHEREDNICHENKO, V.T., polkovnik; CHERNYSHEV, F.I., kontr-admiral zapasa; SHATURNYY, A.N., polkovnik; ROMANOV, I.M., red.

[Methodological materials for political instruction] Metodicheskie materialy k politicheskim zaniatiyam. Moskva, Voenizdat, 1965. 240 p. (MIRA 18:7)

1. Russia (1923- U.S.S.R.) Glavnoye politicheskoye upravleniye Sovetskoy Armii i Voenno-Morskogo Flota. Upravleniye propagandy i agitatsii.

CA

2

The exchange adsorption of cations by bentonite. A. T. Davydov and O. M. Ljiovina. *Kolloid. Zhur.* 11, 804-10 (1949). A bentonite (I) from Crimea had SiO_2 51.78, Al_2O_3 17.87, Fe_2O_3 3.43, MgO 4.14, CaO 2.45, H_2O 14.42%. I which passed through a sieve having 900 openings/sq. cm. and was dried at 60° , increased its vol. 2.5 times in H_2O in 0.1 N-N solns. of NaCl and CaCl_2 . For the cation exchange between I and with Mg, Ca, Sr, or Ba and NaCl or KCl Gapon's equation (*C.A.* 33, 6623) is valid. An equiv. equation is $(1/\sigma_1) = (1/S) + [K\sigma_1^2/(\sigma_1 - \sigma_2)]$; σ_1 is the amt. of bivalent cation remaining in I, σ_2 the amt. displaced (both in mg. equiv. per 100 g. I), $S = \sigma_1 + \sigma_2$ is the original concn. of the univalent cation, and K a const. The "adsorption limit" S was for NaCl and KCl on Mg-I 66 and 55, on Ca-I 140 and 100, on Sr-I 125 and 90, and on Ba-I 83 and 90, whereas the "adsorption capacity" of I detd. by long washing was 121. K increased from Mg to Sr to Ca to Ba (for KCl).

I. J. Bickerman

Chair Gen'l Chem., Khar'kov State Univ. in Gor'kiy

C.A.

12

Dependence of the amount of adsorbed cation on the weight of the adsorbent. A. T. Davydov and I. Ya. Levinskii (A. M. Gorkii State Univ., Kharkov). *Zhur. Obshchei Khim.* (J. Gen. Chem.) 20, 1776-9(1950).—The exchange-adsorption isotherm equation of Gapon (C.A. 28, 4816) calls for a linear relation between $y = g/T$ and $x = (T/w)^{1/n} / [C_0 - (T/w)^{1/n}]^{1/n}$, where g = wt. of adsorbent in g., T = amt. adsorbed, w = vol. of soln./g. adsorbent, C_0 = initial concn., m and n = valencies of the ions exchanged. The validity of this relation is confirmed by expl. data for the exchange of $\text{Ca}^{++} + \text{Na}^+$, $\text{Ca}^{++} + \text{K}^+$, $\text{Sr}^{++} + \text{Na}^+$, $\text{Sr}^{++} + \text{K}^+$, $\text{Ba}^{++} + \text{Na}^+$, and $\text{Ba}^{++} + \text{K}^+$ on glauconitic. N. Thon

CA 1

2

Dependence of the amount of cation adsorbed on the weight of adsorbent. A. T. Davydov and I. Ya. Levitski (A. M. Gorki Kharkov State Univ.). *J. Gen. Chem U.S.S.R.* 20, 1837-40 (1950) (Engl. translation).--See C.A. 49, 417d.
R. M. S.

Davydov, A. T.

Davydov, A.T.

5

Determination of potassium by the cobaltinitrite method
with a calibration chart. A. T. Davydov and Yu. A.
Morozova. *Trudy Nauch. Issledov. Inst. Khim. Khark.
Kov. Univ.* 10, 181-8 (1953); *Izvest. Zhur. Khim.* 1954,
No. 4828. The proposed method is a modification of the
Aleksandrov, (*Po. izvestia* 1946, 719) method in which the
K content is calcul. from a calibration curve obtained with
a soln. contg. 0.2 mg./ml. KCl. M. Hosh

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PM

Davydov, A.T.

✓ Investigation of the dynamics of bivalent cation exchange on H-Wofatit. A. T. Davydov, Yu. A. Morozova, and M. B. Kogan. *Trudy Nauch.-Issledovatel. Inst. Khim. Khark. gos. Univ.* 10, 189-94 (1934); *Referat. Zhur., Khim.* 1954, No. 35712. — The dynamics of Ba^{++} and Ca^{++} on H-Wofatit were studied. The tube consisting of 12 sections was charged with H-Wofatit and after a definite vol. of 0.01N $BaCl_2$ or $CaCl_2$ was passed through it, it was taken apart and the Ba or Ca in each section was detd. by displacement with KCl. The distribution curves showed a parallel advance of the adsorption front; the displacement of the latter being in linear relation with the vol. of the soln. passed through the column, in accordance with the Shilov-Capon equation. The distribution curves proceeded along the tube without changing their shape, a case typical for mol. — gas adsorption and exchange adsorption of univalent ions. M. Hosh.

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DAVYDOV, A. T.

U S S R

Exchange adsorption in mixed media. I. Quantitative rules of cation exchange in mixed media. A. T. Davydov and R. F. Skoblyakov. *Trudy Khim.-Isledovatel'sk. Khim., Khar'kov. Univ.* 10, 193-203 (1953).—The exchange of Ca^{++} and Ba^{++} for Na^+ and K^+ was studied on glauconite in water and water-alc. mixts. contg. 35, 50, and 70 wt. % of alc. Glauconite satd. with the bivalent cation was covered with a soln. of NaCl or KCl. After reaching equil., the amt. of desorbed Ca or Ba was assumed to be equal to the quantity of adsorbed K or Na. The quantity of the 2nd cation in the adsorbent was calcd. from the difference between the max. adsorption and the quantity of desorbed ion. Under these conditions the Nikolski' equation (C.A. 35, 362b) appears, $\sqrt{(a_m - a)(2)/a} = K\sqrt{c_0/c}$, or after simplification: $a = a_m - K^2 a/(100 C_0 - a)^2$, where a is the milligram equiv. of the bivalent cation desorbed from 10 g. of adsorbent and equals the quantity of adsorbed univalent cation, a_m is the max. adsorption, C_0 is the initial concn. of univalent cation in millimole per l., and K is the adsorption const. The exper. results are presented as isotherms on coordinates $1/a$, $a/2/(100 C_0 - a)$ (cf. Gapon equation, C.A. 28, 4149) where a is the quantity of ion in mg. equiv. desorbed from 10 g. of adsorbent and C_0 is the initial concn. of the ion being adsorbed in millimole per l.

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A. I. Davydov

or on coordinates $a, a/(100 C_0 - a)^2$ (modified Nikol'skii equation). The linear shape of the isotherms shows the applicability of these equations to exchange reactions in these systems. Addn. of a solvent with a small dielec. const. shifted the equil. toward displacement of bivalent cations; addn. of 50% alc. lowered the value of the equil. const. to half. The compn. of the solvent had no effect on a_m of glauconite. Use of the modified Nikol'skii equation simplifies the study of cationic exchange. II. Exchange of different valent cations on glauconite in dioxane-water medium. *Ibid.*, 205-9. The exchange of Ba for Na on glauconite was studied in a 70% soln. of dioxane in water. The results were similar to those obtained for water-alc. mixts. The energy of K ion adsorption is appreciably higher than Na ion, and this difference increases with the content of the org. solvent in the mixt. Through *Referat. Zhur., Khim.*, 1954, Nos. 35713, 35714. M. Hosh

2/2

DAVYDOV, A. T., AND RECHINA, E. SH.

Problem of Obtaining Artificial Volkonskoite

Volkonskoite-chromosilicate in comparison with other mineral adsorbents is characterized by high capacity of absorption, large stability during temperature changes and under the action of acids. The applicability of volkonskoite is limited by its rarity. As a result of the reaction of $\text{Cr}(\text{NO}_3)_3$ with Na_2SiO_3 the authors obtained crystalline chromosilicates with capacity for absorption close to that of natural volkonskoite. At a temperature of reaction 100° and for ratio $\text{Cr}(\text{NO}_3)_3:\text{Na}_2\text{SiO}_3$ equal to 1:1 with admixture of 0.1 part of $\text{Al}(\text{NO}_3)_3$ and 0.04 part FeCl_3 , the authors succeeded in obtaining an artificial product with capacity of absorption 123 mg-equiv., which is 21 mg-equiv higher than the capacity of natural volkonskoite. X-ray photographs were not successfully obtained, possibly because of the extremely small crystals. (RZhGeol. No. 5, 1955) Tr. n.-i. in-ta khimii Khar'kovsk. un-ta, 10, 1953, 211-215

SO: Sum. No. 744, 8 Dec 55 - Supplementary Survey of Soviet Scientific Abstracts (17)

Davydov, A. T.

CH ✓ Dolomite method for removing silica from tap water and enriched water. A. T. Davydov and B. D. Bryanskii. *Trudy Nauch.-Issledovatel. Inst. Khim. Khar'kov. Univ.* 10, 217-20 (1953); *Referat. Zhur., Khim.* 1954, No. 47004. The removal of SiO_2 from water contg. 13.5 and 30.0 mg./l. SiO_2 was tested with burnt dolomite. At 45-50° dolomite suspension lowered the SiO_2 concn. in water to 0.9-1.1 mg./l. and at 70-8° to 0.8 mg./l. For each 1 mg. of SiO_2 removed from the water 3-7 mg. MgO was used.

M. Hosh

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DAYDOV, A. I.

V. Polycationic exchange adsorption. I. Investigation of exchange of calcium, magnesium, and barium cations by using solutions saturated with their mixtures for Na^+ and K^+ as affected by the concentration of the displacing cations.
A. I. Daydov and I. Yu. Levitskii, *Trudy Nauch.-Issledov. Inst. Khim. Akad. Nauk SSSR*, 10, 231-31 (1953); cf. C.A. 48, 6771i; preceding entry. The exchange of Ca^{++} , Mg^{++} , and Ba^{++} for Na^+ and K^+ was studied on Wofatit-P.

The Wofatit was satd. with a mixt. of 0.5N $\text{CaCl}_2 + \text{MgCl}_2$ or $\text{MgCl}_2 + \text{BaCl}_2$, washed free of Cl^- , dried, and screened through a 0.2-mm. sieve. 0.5-g. samples of it were then covered with 100 ml. of K^+ or Na^+ solu. Equil. concns. were then detd. by the usual methods. The results were treated by the Capon equation, the Fageler empirical equation, and the modified Nikol'skii equation. All equations were found applicable to the systems studied. In almost all cases a_s was equal to the sum of the max. exchange capacity obtained for each individual cation. In all cases Mg was desorbed to a smaller degree than were Ca and Ba. II. Investigation of the exchange of Ca^{++} , Mg^{++} , and Ba^{++} cations from a mechanical mixture and an adsorbent saturated with each of these ions separately for Na^+ and K^+ as affected by the concentration of the displacing ions. *Ibid.* 233-40.—Portions of Wofatit-P were satd. separately with Ca^{++} , Mg^{++} , or Ba^{++} and equal quantities of each 2 were mixed together. The results were analogous to those previously quoted, but the following order of desorption was obtained: $\text{Ca} > \text{Mg} > \text{Ba}$. Through *Referat. Zhur., Khim.*, 1954, Nos. 35715 and 37516.

M. Hosh

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DAVYDOV, A. T.

The exchange of iron and aluminum ions on a synthetic adsorbent as affected by the pH of the displacing cation solution. A. T. Davydov and I. Ya. Levitskii. *Ukrain. Khim. Zh.* 34, 10361-10363; *Kirol. Zh.*, Khim. 1954, No. 10364. — The exchange adsorption of Fe^{+++} and Al^{+++} from aq. solns. by Wofatit in H^+ and K^+ form was studied under static conditions at various pH values. Wofatit was satd. with Fe and Al separately or combined, 2 l. of 0.5N chloride soln. being used per 100 g. of the adsorbent. Five g. of Wofatit washed free of Cl ions and dried at 50° was covered with 100 ml. of 0.1N KCl (pH 1.97-10.90) or $MgCl_2$ (pH 1.01-5.99). The pH was controlled by adding HCl and KOH to the KCl soln. and HCl to the $MgCl_2$ soln. In equil. solns. the pH was lowered appreciably. Al and Fe in samples of the equil. solns. were detd. by usual methods. The adsorption capacity for Fe was 103.6 and for Al 84.3 mg.-equiv./100 g. The desorption of Fe was 40-60 and of Al 50-70%. The adsorptions on Wofatit in the H^+ and K^+ forms were practically identical. The displacement of Al and Fe dropped with increasing pH of the KCl and $MgCl_2$ solns. The displacement of Fe by K and Mg was independent of the presence of Al on the adsorbent. — In all cases of interaction between the adsorbent and $FeCl_3$ soln. a reduction of Fe^{+++} amounting up to 70% was observed.

M. Hosh

DAVIDOV, A. T.

Many-cation exchange on "sulfocarbon" and wofatite. (3)
 A. T. Davydov and I. Ya. Levitskii (State Univ. Kharkov).
~~Kolloid-Zhur.~~ 16, 13-18 (1954). When an ion exchanger
 contg. cations B, C, and D is equilibrated with a soln. of a
 cation A, the equation $I_1^m/I_2^n/I_3^s = Kc_1^m/c_2^n/c_3^s$ holds if these
 cations are displaced independently from each other;
 I_1 , I_2 , and I_3 are the amts. remaining in the exchanger,
 c_1 , c_2 , and c_3 are the equil. concns., and $1/m$, $1/n$, and $1/s$
 are the valencies of B, C, and D, resp. This equation was
 confirmed by equilibrating "sulfocarbon" contg. NH_4 , Ca,
 and Fe with KCl, MgCl₂, or AlCl₃; in these expts. the
 const. K was 0.00245, 0.00288, and 0.00128, resp. When
 "wofatites" contg. NH_4 , Ca, and Fe were treated with KCl,
 MgCl₂, and AlCl₃, resp., K was 0.00189, 0.00119, and
 0.00081, resp. In all instances, pH of the equil. soln. was
 less (e.g., 2.5 instead of 6) than that of the initial soln.
 The exchange capacities of the adsorbents for all ions in-
 volved were detd.

J. J. Bikerman

DAVYDOV, A.T.

USSR/ Physical Chemistry - Thermodynamics. Thermochemistry. B-8
Equilibrium. Physicochemical Analysis. Phase Transitions.

Abs Jour : Referat Zhur - Khimiya, No 3, 1957, 7473

Author : Davydov, A.T. and Dryanskiy, B.D.

Inst : Kharkov University

Title : Thermal Dissociation of Dolomites and Their Silica
Removing Ability

Orig Pub : Uch. zap. Khar'k. un-ta, 1954, Vol 54; Tr. n.-i. in-ta
khimii i khim. fak. KhGU, Vol 12, 323-331

Abstract : On the basis of literature data and of their own research
the authors present a mechanism for the dissociation of
dolomites and draw conclusions concerning the activity of
the MgO and CaO formed during the dissociation. It is
shown on the basis of an investigation of the removal of
silica from water by magnesium hydroxide from different
sources and at different temperatures that the removal
of silicic acid is most complete when MgO from

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USSR/ Physical Chemistry - Thermodynamics. Thermochemistry. B-8
Equilibrium. Physicochemical Analysis. Phase Transitions.

Abs Jour : Referat Zhur - Khimiya, No 3, 1957, 7473

concentrated dolomite is used at elevated temperatures. The supposition is advanced that compounds of the type $m(\text{Mg}_2\text{SiO}_4)_n(\text{Mg}(\text{OH})_2)$ are formed during the removal of the silica. The above-described method makes it possible to reduce the silicic acid content of water from 40-50 to 0.5-1.0 mg/liter.

Card 2/2

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APPROVED FOR RELEASE: Thursday, July 27, 2000

CIA-RDP86-00513R00050982C

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JRS: L-974-
CRO: 1743-8

THEORY AND PRACTICE OF THE APPLICATION OF ION-EXCHANGE MATERIALS

EXCHANGE MATERIALS

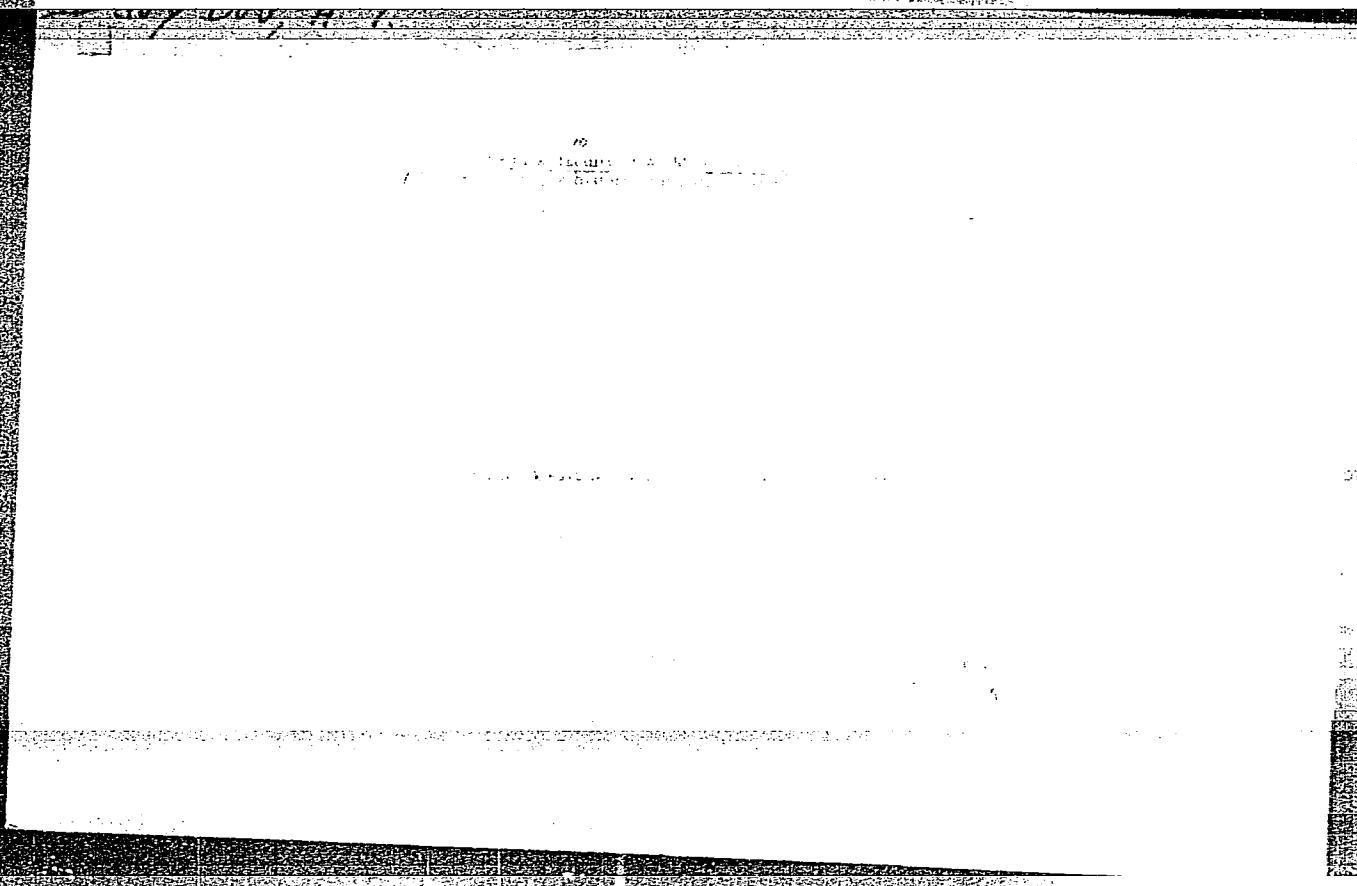
Teoriya i Praktika Primeneniya Ionobmennykh Materialov, Moscow, 1955, pp 1-164.
K. V. Chumtsov

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"APPROVED FOR RELEASE: Thursday, July 27, 2000

CIA-RDP86-00513R00050982



APPROVED FOR RELEASE: Thursday, July 27, 2000

CIA-RDP86-00513R00050982(

DAVYDOV, A.T.

✓ Dependence of exchange sorption of organic ions on their structure. A. T. Davydov and R. F. Skoblionok (A. M. Gor'kii State Univ., Kharkov). *Kolloid. Zhur.* 18, 31-3 (1956). Sulfonated charcoal satd. with Ca^{++} was equilibrated with PhNH_2HCl and the 3 toluidine-HCl isomers. In Capon's equation, $(1/a) = (1/a_\infty) + (K \sqrt{a/2/100a_\infty c})$, the const. K was 13.9-15.3 and the max. amt. a_∞ taken up by 10 g. sorbent was 0.53-0.66 meq. for all 4 salts; thus, the introduction of a Me group had no effect on the ion exchange. a is the amt. exchanged (for 10 g. sorbent) and c is the final concn. of the amine salt. At high c , the amt. of Ca displaced was smaller than the amt. of the amine taken up; perhaps mol. adsorption took place. J. J. Bikerman

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PM

DAVIDOV, A.T.; SKOBLIONOK, R.P.

Dependence of cation exchange adsorption on the dielectric constant of the medium [with English summary in insert]. Koll.shur. 18 no.2: 163-166 Mr-Apr '56. (MLRA 9:8)

1. Khar'kovskiy gosudarstvennyy universitet imeni A.M. Gor'kogo, kafedra obshchey khimii.
(Cations) (Adsorption)

DAVYDOV, A.T.

USSR/Physical Chemistry - Surface Phenomena. Adsorption. Chromatography. Ion Exchange, B-13

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 61226

Author: Davydov, A. T., Skoblionek, R. F.

Institution: None

Title: Investigation of Exchange Adsorption of Cations from Mixed Media on Volkonskoite

Original

Periodical: Zh. obshch. khimii, 1956, 26, No 2, 350-355

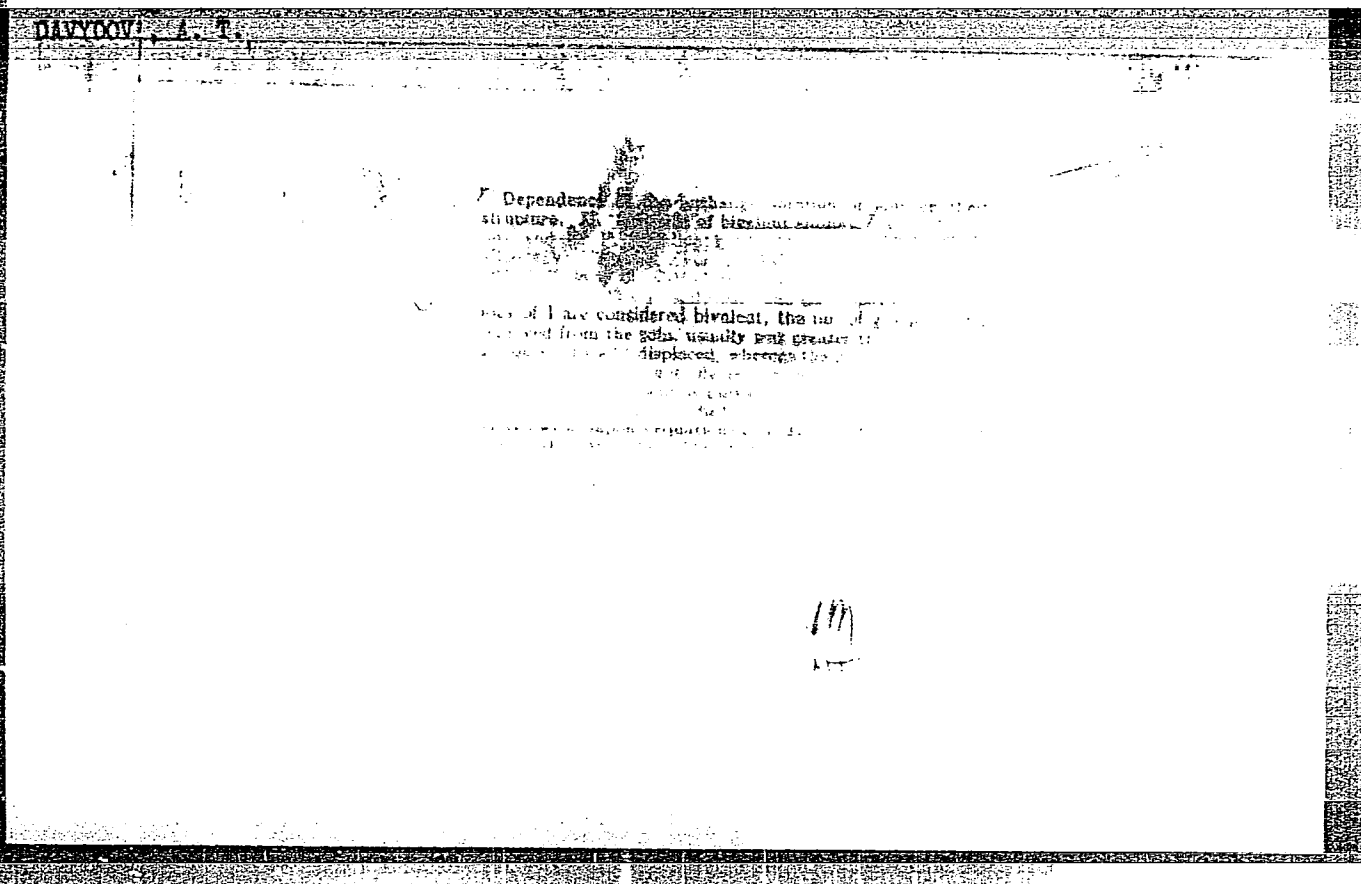
Abstract: Investigation of the correlations in the absorption of Na^+ and K^+ by Ba-forms of volkonskoite, from aqueous alcohol and aqueous dioxane solutions of their chlorides. It was found that the exchange capacity of the sorbent remains constant with all compositions of the solvent. The equilibrium constant calculated in accordance with the equation of Ye. N. Gapon, or B. P. Nikol'skiy, increases with increase of the dielectric permittivity of the medium.

Card 1/1

DAVIDOV, A.T.; SKOBLIONO, R.F.

Study of the exchange sorption of organic ions. Zhur.ob.khim. 26
no.7:1860-1862 J1 '56. (MIRA 9:10)

1. Khar'kovskiy gosudarstvennyy universitet.
(Sorption) (Ions)



DAVYDOV A. T.

73-3-24/24

AUTHOR: Davydov, A. T. and Davydova, R. Z.

TITLE: Ion Exchange Sorption of Silicic Acid on H and H-o Anionites.
(Issledovaniye Ionnoy Obmennoy Sorbtsii Kremnevoy Kisloty
Na Anionitakh Marki H i H-o)

PERIODICAL: Ukrainskiy Khimicheskiy Zhurnal, 1957, Vol. 23, No.3,
pp. 415-419(USSR)

ABSTRACT: Silicic acid can be adsorbed from solutions with H and H-o anionites under static conditions and converted to anions of strong acids. B. P. Nikol'skiy's equation was checked in order to clarify the character of processes taking place during exchange-sorption silicic acid. The silicic acid was adsorbed on H and H-o anionites (synthesised in the Department for Plastic Substances of the Moscow Ghemico-Technological Institute im. D.I Mendeleyeva). When the divalent anion adsorbent is changed to a monovalent adsorbent, Nikol'skiy's equation is as follows:

$$\alpha = \alpha_m - K^2 \alpha \left(\frac{\alpha}{5.000 \cdot C_0 - \alpha} \right)^2$$

where α = quantity of divalent anion (in mg/ekv); desorbed
Card 1/3 from 2 g of the adsorbent, calculated on 100 g

Ion Exchange Sorption of Silicic Acid on H and H-o Anionites. 73-3-24/24

of the adsorbent;

a_m = Maximum adsorption (in mg/ekv) /100 g of the sorbent;

C_o = initial concentration of the anion (in mole/litre)

K_o = constant of change.

When plotted on a graph: $y = a;$
 $x = a \left(\frac{a}{5000C_o - a} \right)^2$

and linear isotherms are obtained. Experimental data, calculated by the method of least squares, are tabulated (Tables 1 and 2). The concentration of the anions was within the limits of 0.05-N to 1-N. The anionite H-o was shown to have greater practical importance which, during the conversion of silicic acid to carbonate ions, revealed a working capacity up to 90 mg/ekv per 100 g of adsorbent. This is 3-times larger than the capacity of glauconite. The anions can be arranged in the following order, according to their absorptive properties: $CO_3 > NO_3 > Cl > SO_4$ which represents the reverse order of adsorption occurring during an exchange on weakly basic anionites. There are 2 tables and 8 Slavic references.

Card 2/3

73-3-24/24
Ion Exchange Sorption of Sillicic Acid on H and H-o Anionites.

SUBMITTED: September, 10, 1956.

ASSOCIATION: Kharkov State University imeni A. M. Gorkiy,
Agricultural Institute imeni V. V. Dokuchayev. (Khar'-
kovskiy Gosudarstvennyy Universitet im. A. M. Gor'kogo,
Sel'skokhozyaystvennyy Institut im. V. V. Dokuchayeva)

AVAILABLE: Library of Congress.

Card 3/3

"APPROVED FOR RELEASE: Thursday, July 27, 2000

CIA-RDP86-00513R00050982

Davydov, A. T.

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APPROVED FOR RELEASE: Thursday, July 27, 2000

CIA-RDP86-00513R00050982(

AUTHOR: Davydov, A. T. SOV/156-58-2-16/48

TITLE: Investigations on the Ion-Exchange of Anions From Mixed Media Using Anionit "MMG" (Issledovaniye obmennoy adsorbtsii iz smeshannykh sred na anionite "MMG")

PERIODICAL: Nauchnyye doklady vysshey shkoly, Khimiya i khimicheskaya tekhnologiya, 1958, Nr 2, pp. 271 - 274 (USSR)

ABSTRACT: The study of the effect of the solvent in the ion-exchange process is very important, especially in relation to its practical applications. The nature of the solvent exerts a considerable influence on the quantity and quality of the adsorbed material in ion-exchange from non-aqueous and mixed media containing clay, soil, and activated charcoal (Refs 1-7). A literature review is given (Refs 1,4,5,9,10). The author investigated the replacement of chloride ions in the Anionit ion-exchange resin by nitrate ions from aqueous solutions and from 20% and 60% alcohol solutions. The Anionit was synthesized at the Chair of Synthetic Materials of the Moscow Chemical Technological Institute imeni D.I.Mendeleev (Kafedra plasticheskikh mass Moskovskogo khimiko-tekhnologicheskogo instituta im.D.I.Mendeleyeva). E.Sh.Rechina participated in the experimental work. The author's conclusions: 1) The inter-

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Investigations on the Ion-Exchange of Anions From
Mixed Media Using Anionit "MMU"

SOV/156-58-2-16/48

change of equivalent anions in water-alcohol medium was found to adhere satisfactorily to the ion-exchange equation

$$a = a_m - K \cdot a \frac{a}{2500 \cdot C_0 - a} \quad (2). \quad 2) \text{ By comparing the ion-ex-}$$

change constants for water and the water-alcohol media it became apparent that with the introduction of an organic component into the solution (60% by weight) the value of the constant may change by as much as 5 times. 3) In all the systems investigated equal values were reported for the maximum quantities removed by exchange, a_m .

This indicates that the composition of the medium exerts no influence on the exchange capacity of the medium or on the number of functional exchange groups in the resin which can exchange ions. Equation (2) may be considered a rule by which not only the ion-exchange constant K , but also the maximum quantity removed by exchange a_m , can be found. Table 1. a shows that the amount of ions replaced in the resin (in mg-equivalents per 100g. of exchange resin) equals the amount of ions removed from solution. C_0 is the initial concentration of the resin ions in mg-mol per ml.

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Investigations on the Ion-Exchange of Anions From
Mixed Media Using Anioni: "MMG"

SOV/156-58-2-16/48

There are 1 table and 10 references,

which are Soviet.

ASSOCIATION: Kafedra obshchey khimii Khar'kovskogo gosudarstvennogo universi-
teta im.A.M.Gor'kogo (Chair of General Chemistry of the Khar'kov
State University imeni A.M.Gor'kiy)

SUBMITTED: October 28, 1957

Card 3/3

AUTHORS: Davydov, A.T., Davydova, R.Z. SOV-69-58-4-5/18

TITLE: Investigation of the Laws of Polyanionic Exchange (Issledovaniye zakonomernostey polianionnogo obmena)

PERIODICAL: Kolloidnyy zhurnal, 1958, Vol XX, Nr 4, pp 425-428 (USSR)

ABSTRACT: The practical application of the ion exchange chromatography is based on the quantitative laws of the cation and anion exchange. The exchange of anions has not been sufficiently investigated. In the article, the quantitative laws of anion exchange on the anionite type MMG are studied. Gapon's equation (Ref. 8) for the tri-ionic exchange was used as theoretical basis of the investigation. It states that the displacing of ion M_1 takes place independently of the displacing of ion M_2 , etc. Equation (5) shows that the relation of ion quantities absorbed by the solid phase is proportional to the concentrations of these ions in a solution at equilibrium. The application of Gapon's equation (6) to anion exchange in solutions from 0.1-1 N is not possible. It was established that the equation is valid only for concentrations of the displacing anion from 0.1-0.03 N. The capacity of the MMG anionite for carbonate ions is nearly double that for sulfate ions which is explained by the selectivity of the

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Investigation of the Lows of Polyanionic Exchange

SOV-69-58-4-5/18

anionite for carbonate ions.

There is 1 table and 10 references, 8 of which are Soviet,
1 English, and 1 German.

ASSOCIATIONS: Khar'kovskiy gosudarstvennyy universitet imeni A.M. Gor'kogo
(Khar'kov State University imeni A.M. Gor'kiy)
Khar'kovskiy sel'skokhozyaystvennyy institut imeni V.V. Dokuchayeva
(Khar'kov Agricultural Institute imeni V.V. Dokuchayev)

SUBMITTED: June 2, 1956

1. Chromatographic analysis--Applications
2. Ion exchange--Applications

Card 2/2

AUTHORS: Davydov, A. T., Skoblionok, R. F. SOV/76-32-8-2/37

TITLE: The Influence of the Medium on the Ion Exchange Adsorption (Vliyaniye sredy na ionoobmennuyu adsorbtsiyu) The Dependence of the Exchange Constant on the Dielectric Constant of the Solvent (Zavisimost' konstanty obmena ot dielektricheskoy postoyannoy rastvoritelya)

PERIODICAL: Zhurnal fizicheskoy khimii, 1958, Vol. 32, Nr 8, pp. 1703-1710 (USSR)

ABSTRACT: The publications by N.A. Shilov (Ref 12), M.M. Dubinin (Ref 13), Wigner and Jenny (Vigner and Yenni) (Ref 9), A.M. Pryanishnikova (Ref 1), D.N. Strazhesko (Refs 10,11), Kressman and Kitchener (Ref 3), show that the influence of the composition of the liquid phase on absorption processes is determined by several factors. To find a possibility of determining the maximum effect in these processes the authors investigated the dielectric constant of the solvent. The inter-dependence between the exchange constant and the dielectric constant of the solvent already observed may be explained by a change of the activity coefficient. To prove

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The Influence of the Medium on the Ion

SOV/76-32-8-2/37

Exchange Adsorption. The Dependence of the Exchange Constant on the Dielectric Constant of the Solvent

this the equations by B.P. Nikol'skiy (Ref 14) and Ye.N. Gapon (Ref 19) are explained and a derivation of the equations is carried out according to explanations by V.K. Semenchko (Ref 21), with data by Scatchard (Skatchard) (Refs 22,23) being used. It was found that the function $\lg K = f(1/D)$ is represented by a curve of second order. In the case that the radius of the displacing ion is smaller than that of the displaced ion the summary curve has the shape of a hyperbola. This is found in the exchange of Ca^{2+} and Ba^{2+} ions on K^+ and Na^+ ions. If, however, the radius of the displacing ion is greater than that of the displaced one a parabolic curve is obtained. It will occur in an exchange adsorption of the Li^+ ion. There are 2 figures, 3 tables, and 23 references, 19 of which are Soviet.

Card 2/3

The Influence of the Medium on the Ion Exchange Adsorption. The Dependence of the Exchange Constant on the Dielectric Constant of the Solvent SOV/76-32-8-2/37

ASSOCIATION: Khar'kovskiy gosudarstvennyy universitet im. A.M. Gor'kogo
(Khar'kov State University imeni A.M. Gor'kiy)

SUBMITTED: June 8, 1956

Card 3/3

Davy Dov, A.T.

5(2),(3)

PHASE I BOOK EXPLOITATION

SOV/2554

Akademiya nauk SSR. Otdeleniye khimicheskikh nauk. Komissiya po khromatografii

Issledovaniya v oblasti ionoobmennoy, raspredelitel'noy i osadochnoy khromatografii (Studies in the Field of Ion Exchange, Distribution and Precipitation Chromatography) Moscow, Izd-vo AN SSSR, 1959. 150 p. Errata slip inserted. 3,500 copies printed.

Ed. of Publishing House: N.G. Yegorov; Tech. Ed.: I.N. Guseva; Editorial Board: K.V. Chmutov, Corresponding Member, USSR Academy of Sciences (Resp. Ed.); F.M. Shemyakin, Professor; K.M. Ol'shanova, Professor; K.M. Saldadze, Docent, and N.N. Tunitskiy, Professor.

PURPOSE: This book is intended for chemists and chemical engineers.

COVERAGE: The book discusses studies in ion-exchange, distribution, and precipitation chromatography. Various problems of the theory of chromatography and its application are also considered. This is the 4th collection of articles published by the Committee on

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Studies in the Field of Ion Exchange (Cont.)

SOV/2554

Chromatography. The first collection was published in 1952 under the title: "Issledovaniya v oblasti khromatografii" (Studies in the Field of Chromatography); the second was published in 1955 under the title "Teoriya i praktika primeneniya ionoobmennyykh materialov" (Theory and Practice of the Use of Ion-exchange Materials); and the third was published in 1957 under the title "Issledovaniya v oblasti ionoobmennoy khromatografii" (Studies in the Field of Ion-exchange Chromatography). No personalities are mentioned. References are given after most of the articles.

TABLE OF CONTENTS:

Yakhontova, L.F., Ye. M. Savitskaya, and B.P. Bruns. Pseudo- and True Equilibria in Ion Exchange Processes on Carboxylic Ionites With Participation of Streptomycin 3

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Rachinskiy, V.V. Theory of the Stationary Front of Dynamic Sorption 24

Card 2/5

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5(4)

SOV/76-33-4-17/32

AUTHORS: Davydov, A. T., Tolmacheva, Yu. A.

TITLE: Investigation of the Dynamics of Ion Exchange on Sulfo-carbon (Issledovaniye dinamiki ionnogo obmena na sul'fougile)

PERIODICAL: Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 4, pp 858-862 (USSR)

ABSTRACT: The exchange of hydrogen ions with potassium ions under static and dynamic conditions was investigated in sulphonated carbon (SC). The experimental results obtained were explained from the viewpoint of the dynamic theory of ion exchange of monovalent ions by O. M. Todes and V. V. Rachinskiy (Refs 8-11). The (SC) applied exhibited a dispersity of 0.25 - 0.50 mm in air-dry state and was saturated with hydrogen ions. The method of determining the capacity of the sorbent is described. The exchange constant (EC) was computed according to an equation (2) (Table 1) and its mean value is $K = 0.85$. 7 different chromatogram columns with different layers of the sorbent were used for the investigations under dynamic conditions, a 0.01 n KCl-solution was let through and the velocity of motion of the stationary front was determined (Table 2). Its mean value was 0.068 cm/min. By means of the equations derived by O. M.

Card 1/2

SOV/76-33-4-17/32

Investigation of the Dynamics of Ion Exchange on ~~Sulfocarbon~~

Todes and V. V. Rachinskiy the filtration cross section within the sorbent was computed (Table 3) as well as the dynamic coefficient, the coefficient of sorption velocity and the curve of the yield (in the concentration range $0.1 \leq \varphi \leq 0.9$) (Fig 1). The rules observed experimentally could be satisfactorily reproduced by the above-mentioned equations. In conclusion the authors thank V. V. Rachinskiy. There are 2 figures, 3 tables, and 13 Soviet references.

ASSOCIATION: Khar'kovskiy gosudarstvennyy universitet im. A. M. Gor'kogo
(Khar'kov State University imeni A. M. Gor'kiy)

SUBMITTED: September 25, 1957

Card 2/2

TOLMACHEVA, Yu.A.; DAVYDOV, A.T. (Kharkov)

Exchange of sulfate ions for chloride and iodide ions
on exchanger N-O under flow conditions. Zhur.fiz.khim.
34 no.6:1260-1264 Je '60. (MIRA 13:7)

1. Khar'kovskiy gosudarstvennyy universitet im. A.M.
Gor'kogo, Institut khimii.
(Ion exchange)

TOLMAGHEVA, Yu.A.; DAVYDOV, A.T.

Study of univalent ion exchange on an H - O anion exchanger under dynamic conditions at various flow rates. Zhur.fiz.khim. 35 no.9: 2052-2059. '61. (MIRA 14:10)

1. Nauchno-issledovatel'skiy institut khimii Khar'kovskogo gosudarstvennogo universiteta imeni A.M. Gor'kogo.
(Ion exchange)

TOLMACHEVA, Yu.A.; DAVYDOV, A.T.

Exchange of sulfate ions for a mixture of chloride and iodide ions on an H-O anion exchanger under dynamic conditions. Zhur.-fiz.khim. 36 no.5:929-932 My '62. (MIRA 15:8)

1. Khar'kovskiy gosudarstvennyy universitet imeni A.M.Gor'kogo.
(Ion.exchange) (Sulfates) (Halides)

TOLMACHEVA, Yu. A.; DAVIDOV. A. T.

Exchange of monovalent ions on the EDE-10P anion exchanger under dynamic conditions depending on the rate of solution flow and size of the anion exchanger grain. Zhur. fiz. khim. 36 no.12:2653-2658 D '62. (MIRA 16:1)

1. Nauchno-issledovatel'skiy institut khimii i Khar'kovskiy gosudarstvennyy universitet imeni A. M. Gor'kogo.

(Ion exchange)

TOLMACHEVA, Yu.A.; DAVYDOV, A.T.

Study of the exchange dynamics of univalent anions on the
EDE-10P anion exchanger based on the rate of solution
flow. Izv.vys.uch.zav.; khim.i khim.tekh. 5 no.4:579-584
'62. (MIRA 15:12)

1. Khar'kovskiy gosudarstvennyy universitet imeni
A.M. Gor'kogo, kafedra obshchey khimii.
(Ion exchange)

TOLMACHEVA, Yu.A.; DAVYDOV, A.T.

Univalent ion exchange on an H - O anion exchanger occurring
under dynamic conditions as dependent on the grain size of
the anion exchanger. Zhur. fiz. khim. 36 no.1:148-152 Ja '62.
(MIRA 16:8)

1. Khar'kovskiy gosudarstvennyy universitet im. Gor'kogo,
Nauchno-issledovatel'skiy institut khimii.
(Ion exchange)

DAVYDOV, A.T.; LISOVINA, G.M.

Mechanism of the ion exchange sorption of anions of salts and acids on weakly basic anion exchangers. Zhur. fiz. khim. 36 no.9:1993-1998 S '62. (MIRA 17:6)

1. Khar'kovskiy gosudarstvennyy universitet imeni Gor'kogo.

TOLMACHEVA, Yu.A.; DAVYDOV, A.T. (Khar'kov)

Dynamics of anion exchange on the anion exchanger EDE-10² as dependent on the flow rate under conditions of concave sorption isotherm. Zhur. fiz. khim. 36 no.11:2347-2351 N'62.

(MIRA 17:5)

1. Khar'kovskiy gosudarstvennyy universitet imeni A.M. Gor'kogo.

DAVIDOV, A.T.

Effect of the solvent on anion exchange on a weak base
anion exchanger "H." Ukr. khim. zhur. 29 no.4:368-372 '63.
(MIRA 16:6)

1. Khar'kovskiy gosudarstvennyy universitet im. A.M. Gor'kogo.
(Ion exchange) (Solvents)

SKOBLIONOK, R.F.; DAVYDOV, A.T.

Exchange sorption of ions from nonaqueous media. Part 1. Zhur.
fiz. khim. 37 no.12:2648-2653 D '63. (MIRA 17:1)

1. Khar'kovskiy gosudarstvennyy universitet imeni A.M. 'Gor'kogo.

ACCESSION NR: AP4023497

S/0069/64/026/002/0174/0178

AUTHOR: Davy*dov, A. T.; Nagornaya, N. A.

TITLE: Studies of exchange sorption of organic cations as a function of their structure

SOURCE: Kolloidny*y zhurnal, v. 26, no. 2, 1964, 174-178

TOPIC TAGS: exchange sorption, sorption, desorption, organic cation, organic cation structure, KY 2 type electrolyte, aniline, para phenylenediamine, benzi-dine, alpha naphthylamine, volume equivalence, electrostatic mechanism, ion exchange mechanism, ion polarity, ion size, ionic symmetry

ABSTRACT: This study concerned exchange behavior between mineral and or-ganic ions as related to their structure, size and the charge quantities. It was conducted in a strongly acidic cation-electrolyte of the KY-2 polymerized type in calcium form. The amines to be studied (aniline, p-phenylenediamine, ben-zidine, α -naphthylamine, p-toluidine and 4,4-diaminodiphenylmethane) were dissolved in hydrochloric acid at from 0.23 to 0.56 N, depending upon their sol-

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ACCESSION NR: AP4023497

ability. A mixture of 2 g sorbent and 100 ml amine solution was used for testing, i. e. determining the equilibrium concentration of calcium by means of trilon B, and the amine quantity by potentiometric titration with sodium nitrite. Sorption isotherms were calculated on the basis of these experimental data by the equation

$$a = a_m - K^{z_1 z_2} \left(\frac{a}{V c_0 - a} \right)^{z_1/z_2}, \quad (1)$$

where a is the desorbed ion quantity (mg equivalent/100 g), a_m the end sorption (mg eq. 100 g sorbent), c_0 initial concentration of the displacing ion (mg eq. / ml) K the exchange constant, z_1 and z_2 charges of the exchange ions, V solution volume. Experimental and theoretical results are tabulated and show volume equivalence to decrease considerably upon increase of amine concentration. The former was retained for up to 0.25 N concentration of the organic ion. Its disturbance was accompanied by surface-equivalent sorption of the organic ion, i. e. through the electrostatic (apolar ion part) rather than the ion exchange mechanism (polar part). Comparing calcium desorption by the various cations, e. g. p-phenylenediamine to aniline, that by the first was much higher, due to the

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ACCESSION NR: AP4023487

symmetrical location of the 2 polar centers with each about 1/2 the apolar charge and increased polarity due to the conjugated bonds between the amino groups, while aniline consists of a large apolar phenyl and a small ionogenic NH_3^+ cation. The increased number of aromatic rings in the α -naphthylamine ion influenced its sorbability compared to that of aniline at equal charges. Higher cation sorption in this case may also be due to the two-fold size of the apolar naphthylamine ion. The behavior of the other organic ions is discussed. The authors conclude that this ion exchange chromatographic method may be used to study structural features of organic ions. The behavior of single and double charged organic cations was characterized by the equivalent behavior of the ionogenic groups in the exchange reaction. Increase of phenyl groups in the cation also increased its sorption value. The exchange equivalence between calcium ions and organic cations was strictly retained only to 0.25 N. "We wish to thank Professor L. M. Litvinenko for his interest in this work and his valuable advice." Orig. art. has: 1 equation and 1 table.

ASSOCIATION: Khar'kovskiy universitet im. A. M. Gor'kogo (K harkov University)

SUBMITTED: 05Sep63

DATE ACQ: 15Apr64

ENCL: 00

SUB CODE: .GC

NO REF SOV: 009

OTHER: 006

Card 3/3

DAVYDOV, A.T.; SKOBLIONOK, R.F.

Exchange ion sorption from nonaqueous media: effect of acid
solvents on the sorption of univalent cations. Koll. zhur.
26 no.4:425-430 J1-Ag '64. (MIRA 17:9)

1. Khar'kovskiy universitet, kafedra obshchey khimii.

DAVYDOV, A.T.; PONIROVSKAYA, L.I.

Exchange sorption of anions of organic acid salts as dependent on their structure. Ukr. khim. zhur. 31 no.3:297-301 '65. (MIRA 18:4)

1. Khar'kovskiy gosudarstvennyy universitet im. A.M. Gor'kogo.

DAVYDOV, A.V., revisor-zemlemer.

Advice of a land organizer. Zemledelie 6 no.5:82-84 My '58.
(Surveying) (MIRA 11:6)

DAVYDOV, A. V., Eng.

Standardization

"Some organizational shortcomings in standardizing work." Vest. mash. 32 no. 4, 1952.

9. Monthly List of Russian Accessions, Library of Congress, October 1952, Uncl.

DAVYDOV, A. V.

24466 DAVYDOV, A. V. Penitsillinoterapiya pri zheltukhakh u Dol'nykh sifilisom.
Vracheb. Delo, 1949, No. 8, STB. 761-04.

SO: Letopis, No. 32, 1949.

DAVIDOV, A. V.

Elastic scattering of 3Mev. neutrons by bismuth and sodium nuclei.
Nek. vop. inzh. fiz. no. 1:30-42 '57. (MIRA 12:5)
(Neutrons—Scattering) (Bismuth) (Sodium)

21(8)
 AUTHORS: Burgov, N. A., Davydov, A. V., SOV/56-36-6-57/66
 Kartashov, G. R.

TITLE: The ^{Lifetime} of the First Excited States of Rb⁸⁵ and Pr¹⁴¹ (Vremya
 zhizni pervykh возбужденных состояний Rb⁸⁵ i Pr¹⁴¹)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959,
 Vol 36, Nr 6, pp 1946-1947 (USSR)

ABSTRACT: A report is given on life measurements of the 150 kev level
 of Rb⁸⁵ and the 142 kev level of Pr¹⁴¹ carried out by the
 method of delayed β - γ -coincidences. The experimental arrange-
 ment consisted of two scintillation counters with tolane
 crystals and a FEU-33 (photo-multiplier); coincidence resolu-
 tion time $2\tau_0 = 4.5 \cdot 10^{-9}$ sec. The sources used were Kr⁸⁵ and
 Ce¹⁴¹, obtained by the irradiation of natural krypton and
 cerium in a reactor. The gaseous radioactive krypton was
 located in a brass cylinder (3 atmospheres absolute pressure),
 the end of which was closed by means of a terelene foil
 (1 mg/cm²). The cerium source (a pulverulent oxide) was
 located in form of a thin layer on an Al foil. Measuring

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The ^{Lifetime} / of the First Excited States of Rb^{85} and Pr^{141} SOV/56-36-6-57/66

results are shown by a figure; a diagram shows the number of β - γ -coincidences ($N_{\beta\gamma}$) in dependence on the delay time. It holds that $N_{\beta\gamma} = N_0 \exp(-t/\tau_\gamma)$ if $t \gg \tau_0$. τ_γ is the average life time of an excited state emitting γ -quanta. Evaluation of the measuring results according to the method of the least squares gave the following results:

$$\tau_\gamma(\text{Rb}^{85}) = (1.14 \pm 0.12) \cdot 10^{-9} \text{ sec}, \tau_\gamma(\text{Pr}^{141}) = (2.32 \pm 0.17) \cdot 10^{-9} \text{ sec.}$$

For these two isotopes the ratio between the experimentally determined lifetime of the levels and that determined by Moszkowski (Ref 2) is 210 and 230 respectively. There are 1 figure and 2 references.

ASSOCIATION: Institut teoreticheskoy i eksperimental'noy fiziki Akademii nauk SSSR (Institute of Theoretical and Experimental Physics of the Academy of Sciences, USSR)

SUBMITTED: March 13, 1959

Card 2/2

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S/075/61/016/001/013/019
B013/B055

AUTHORS: Davydov, A. V., Dobrolyubskaya, T. S., and Nemodruk, A. A.

TITLE: Quantitative Determination of Uranium Based on Its
Fluorescence in Phosphoric-acid Solutions

PERIODICAL: Zhurnal analiticheskoy khimii, 1961, Vol. 16, No. 1,
pp. 68-72

TEXT: The present publication describes a highly sensitive method suggested for the determination of uranium basing on its fluorescence in phosphoric-acid solutions. The authors studied the dependence of the fluorescence intensity of uranyl-nitrate solutions (containing 100 μ U/ml) on the addition of various substances (Table 1). The most intensive fluorescence occurs in phosphoric-acid solutions of uranyl salts, mono-substituted phosphates, sulfate- and fluoride ions producing the next highest fluorescence. The measurements were carried out in a horizontal Pulfrich photometer. Fluorescence excitation was carried out by ultra-violet irradiation (253.7 $m\mu$) from above by means of a BYB -15 (BUV-15) germicidal lamp with a YC2 -1 (USF-1) filter. A ЭФ-3 (EF-3) photoelectric

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Quantitative Determination of Uranium Based
on Its Fluorescence in Phosphoric-acid
Solutions

88584

S/075/61/016/001/013/019
B013/B055

fluorimeter produced by the zavod Kontrol'no-izmeritel'nykh priborov Ministerstva pishchevoy promyshlennosti (Moskva) (Plant for Control Instruments of the Ministry of Food Industry (Moscow)) is recommended for measuring fluorescence intensities of phosphoric-acid solutions with low uranium contents (0.1 - 10 μ U/ml). At very low concentrations (up to $\sim 1 \cdot 10^{-4}$ g U/ml) of uranium(VI) in 5% phosphoric-acid solutions the fluorescence intensity was found to vary linearly with the uranium concentration (Fig. 1). At concentrations higher than $\sim 2.5 \cdot 10^{-4}$ g U/ml the fluorescence intensity decreases with increasing uranium concentration. The fluorescence of phosphoric-acid solutions of uranium(VI) may therefore be utilized for the quantitative determination of uranium(VI) at concentrations of $< 1 \cdot 10^{-4}$ g U/ml. Measurements in the short-wave region of the ultraviolet radiation by means of a C Φ -4 (SF-4) spectrophotometer showed that the addition of phosphoric acid to a nitric-acid solution of uranium(VI) increases the absorption (Fig. 2), and, to a much greater extent, the fluorescence. The latter is excited both by short-wave and long-wave ultraviolet light. In dilute solutions, excitation by short-

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Quantitative Determination of Uranium Based on
Its Fluorescence in Phosphoric-acid Solutions

S/075/61/016/001/013/019
B013/B055

wave ultraviolet light (253.7 mμ) produces a much higher intensity of fluorescence. Studies in the temperature range 0° - 90°C showed that the fluorescence intensity of uranium(VI) in phosphoric-acid solution increases with decreasing temperature. The standard- and test solutions must therefore be at the same temperature. Within a limited range, the fluorescence intensity also depends on the phosphoric-acid concentration (Fig. 3). It increases with an increase in the acid concentration up to 5% and from then on remains unchanged at further addition of phosphoric acid. The quantitative determination of uranium basing on its fluorescence in aqueous phosphoric-acid solution can be performed after separating the quenching impurities (Fe, Cu, Mn, Cr, Ni, Co, and others) by uranium extraction. Tributyl phosphate (Refs. 7,8) was used as extraction solvent, carbon tetrachloride as diluent and calcium nitrate as salting agent. Prior to extraction, the quenching impurities were masked by addition of Complexone III. Extraction of uranium from nitric-acid solutions containing 40% $\text{Ca}(\text{NO}_3)_2 \cdot 4\text{H}_2\text{O}$ with an equal volume of a 20% tributyl phosphate solution in carbon tetrachloride results in 99.9% recovery of uranium. A second extraction with the same quantity of tributyl-phosphate/carbon-

X

Card 3/4

22999

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S/186/61/003/002/009/018
E142/E435

AUTHORS: Paley, P.N., Nemodruk, A.A. and Davydov, A.V.
TITLE: Rapid extraction - photometric determination of uranium
with the reagent arsenazo III

PERIODICAL: Radiokhimiya, 1961, Vol.3, No.2, pp.181-186

TEXT: Rapid methods of analysis are very important during the determination of uranium in ores, minerals and other samples and in complex solutions. The simplest and most rapid method is the direct determination of the element in the samples without preliminary separation of other elements which might interfere with the reaction. However, since such methods have not been discovered hitherto the inhibiting elements have to be separated by extraction. Uranium can be separated by a one-stage extraction process by using tributyl phosphate. The described method comprises: preliminary extraction of uranium with a 20% solution of tributyl phosphate in carbon tetrachloride whilst using ammonium nitrate as a salting-out agent and complexone III for retaining inhibiting elements in the aqueous phase; the uranium is then re-extracted with arsenazo III-solution and photometric

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Rapid extraction ...

measurements are carried out. Quantities of 0.002 to 1.5 γ /ml can be determined in the tested samples as the element can be concentrated during the processes of extraction and re-extraction. Arsenazo III was found to be the most satisfactory reagent for the photometric determination (amongst such reagents as arsenazo I, arsenazo II, pyrocatechol violet, morin, and toron); it has a high degree of selectivity and sensitivity. Moreover, complete re-extraction of uranium is achieved and the optical density of the obtained re-extracts does not depend on changes in the concentration of the acid (within fairly wide limits). These advantages are due to the increased intensity of the coloured complex formed by arsenazo III with uranium which, according to data by S.B.Savvin (DAN SSSR, 127, 6, 1231 (1959)), has a 8000 times higher strength than the corresponding complex with arsenazo I. Maximum coloration during the determination of UVI occurs already at pH = 1.7 whereas with the other abovementioned reagents it only sets in at pH = 6. A photo-electrocollimator Φ ЭК-Н-57 (FEK-N-57) with a red lightfilter No.8 (effective wavelength: 656 m μ) or a spectrophotometer (655 m μ) were used during these experiments.

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With the photo-electrocollimator, the experimental error does not exceed 3.3%. If a spectrophotometer is used, the accuracy of determination is somewhat higher. If the solution to be analysed contains larger quantities of fluorides or phosphates, extraction must be carried out by using a 40% solution of aluminium nitrate as salting-out agent, which does not contain complexone III. The obtained extract is then washed with 20 ml of a 50% solution of ammonium nitrate (pH = 3) which is saturated with complexone III. There are 1 figure, 3 tables and 12 references: 7 Soviet-bloc and 5 non-Soviet-bloc. Four of the references to English language publications read as follows: G.H.Morrison, H.Freiser. Solvent Extraction in Analytical Chemistry. N.Y. (1957); J.Clinch, M.Guy, Analyst, 82, 850 (1957); Z.I.Dizdar, I.D.Obrenović, Analyst, 83, 177 (1958); Z.I.Dizdar, I.D.Obrenović, Second UN International Conference on the Peaceful Uses of Atomic Energy, 1958, p.471.

SUBMITTED: May 6, 1960

Card 3/3

S/048/61/025/002/002/016
B117/B212

AUTHORS: Kartashov, G. R., Burgov, N. A., and Davydov, A. V.

TITLE: Form of the beta spectrum of A^{41}

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, v. 25,
no. 2, 1961, 189-193

TEXT: The present paper was read at the 11th Annual Conference on Nuclear Spectroscopy (Riga, January 25 to February 2, 1961). The authors have investigated the form of the beta spectrum for transitions on the $^{41}_{18}A$ nucleus absolutely forbidden in first order. The decay scheme of this nucleus is shown in Fig. 1 (Ref. 3). All measurements were made on a beta spectrometer free of iron with a magnetic lens (Refs. 5 and 6). The beta spectrum was investigated by using electrons which were emitted from the source at an angular interval of $40\div 75^\circ$ with respect to the instrument. This source was a hollow cylinder, 10 mm high and 10 mm in diameter. Its outer side was covered with a 15 mg cm^{-2} thick Terylene foil. The cylinder was filled with argon under a pressure of $300\div 400 \text{ mm Hg}$. This argon was spectroscopically pure and had been irradiated in a container. A scintillating
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S/048/61/025/002/002/016
B117/B212

Form of the beta....

plastic cylinder, height 10 mm, diameter 10 mm, with a photomultiplier of the type 33) -35 (FEU-35) served as detector. The relative half-width $\Delta(H\phi)/H\phi$ of the lines was 2.4%. The pulses were fed from the FEU, via a cathode follower, to the integral discriminator and recorded by counters. Corrections for the weak constant background and for the background of gamma emission of the A^{41} source were made in the beta spectrum of the $^{18}A^{41}$ nucleus to be investigated. Two beta components may be clearly distinguished in this beta spectrum. Analysis of the soft beta spectrum shows that it has a permissible structure, i.e., for this spectrum the Fermi curve is linear for energies $E_\beta > 400$ kev. At $E_\beta < 400$ kev, there is an excess of electrons which can be explained by electron scattering in the source and on the spectrometer walls. Analysis of the partial spectrum at small energies has been made by subtracting the high-energy spectrum from the experimental spectrum. It was assumed that this spectrum had a form which is characteristic of spectra ($\Delta I = 2$, yes) absolutely forbidden in first order. In this case $N(p)dp = AF(Z,W)p^2 (W - W_0)^2 (p^2 + q^2)dp$ (3) holds; Here, $F(W,Z)$ is the Fermi function, q the momentum of the m_0c units, W - total energy of electrons in m_0c^2 , w_0 the break-off energy of

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Form of the beta ...

the beta spectrum, in $m_0 c^2$ units. In a high-energy spectrum there may occur electrons with low energies that have been scattered inside the spectrometer. In order to determine this correction the spectrum of P^{32} has been investigated. An independent analysis of the gamma-radiation energy of A^{41} for conversion electrons and for the break-off energy of the low-energy spectrum made it possible to find the break-off energy of the partial high-energy beta spectrum. The studies yielded the following results: The ground state of A^{41} and the first excited state of K^{41} showed a spin-parity characteristic. It may be assumed that the normal state of A^{41} , the first excited state of K^{41} , and the ground state of Ca^{41} have the same isotopic spin. The beta spectrum which corresponds to the transition between the normal states $A^{41} - K^{41}$ has a form that can be described by equation (3) with an accuracy of 1-1.2%, 2%, i.e., the correction to the beta spectrum as suggested by the theory of Gell-Mann-Feynman has not been confirmed. According to calculations made in Ref. 2, a correction factor of the form $(1 + \lambda W)$ has to be used for the case in question and the corrected Fermi curve of the partial high-energy beta spectrum of A^{41} must be inclined. The correction factor at the end of the spectrum must be equal to 1.02. The authors state that for this case it is possible to compensate for the

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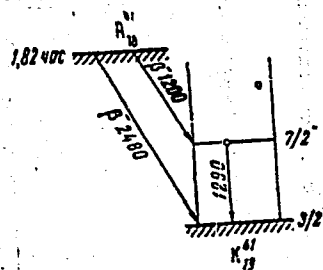
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Form of the beta ...

correction since the form of the beta spectrum may be influenced by corrections due to the theory of weak interactions and also by other corrections. In order to evaluate these corrections the matrix elements have to be estimated for transitions forbidden in third order. Basically, this problem may be solved by applying the shell model. The authors thank I. S. Shapiro for discussions, V. G. Alpatov, Yu. I. Nekrasov, and A. I. Zubkov for their help in measurements. There are 5 figures and 7 references: 3 Soviet bloc.

ASSOCIATION: Institut teoreticheskoy i eksperimental'noy fiziki Akademii nauk SSSR (Institute of Theoretical and Experimental Physics of the Academy of Sciences USSR)

Fig. 1



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26686
S/056/61/041/005/001/038
B104/B108

AUTHORS: Burgov, N. A., Davydov, A. V., Kartashov, G. R.
TITLE: Comparative measurements of the shapes of the Au¹⁹⁸ and Zn⁶⁹
β-spectra
PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 41,
no. 5(11), 1961, 1337-1339

TEXT: The Au¹⁹⁸ and Zn⁶⁹ β-spectra were measured under equal conditions by means of an ironless toroidal β-spectrometer. The sources were prepared by evaporation of one drop of nitric acid solution which was put on a layer of insulin on an aluminum backing (0.6 mg/cm²). The diameter of the sources was 25 mm. The β-spectra of three Au sources (25, 50, and 100 μg/cm²) were equal for electrons of more than 80 kev within the error of measurement (~1%). The β-spectra of two Zn sources (50 and 100 μg/cm²) both had the same shape within the error of measurement. Ten series of measurements were carried out with 50-60 μg/cm² sources. A new source in every series was used. The electron detector was an end-window counter with a mica window (1.6 mg/cm²). The β-spectra were compared by
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Comparative measurements of ...

superposing the straight parts of the Fermi diagrams (Fig.). In the range of lower electron energies the difference between the curves is $(6.5 \pm 0.5)\%$. In the Au^{198} β -spectrum, a shortage of low-energy electrons was found. The contribution of the Au^{199} β -spectrum is estimated to some hundredths percent. The deviation of the zinc Fermi diagram from a straight line at low electron energies is caused by electron scattering in the β -spectrometer. The results show that the excess of low-energy electrons in the Au^{198} β -spectra discovered by R. M. Steffen (see below) is not caused by an increase of the form factor of the β -spectrum. B. V. Geshkenbeyn and A. P. Rudik (ZhETF, 38, 1896, 1960) are mentioned. The authors thank O. N. Vasil'yeva for mathematical evaluation of the experimental results, V. G. Alpatov and Yu. I. Nekrasov for assistance in the measurements. There are 1 figure and 6 references: 4 Soviet and 2 non-Soviet. The 2 references to English-language publications read as follows: R. B. Duffield, L. M. Langer, Phys. Rev., 89, 854, 1953; R. M. Steffen, Proc. Rehovoth Conf. on Nuclear Structure, September 1957, New York, 1958, p. 419.

SUBMITTED: January 27, 1961 (initially) June 28, 1961 (after revision)

Card 2/3

33761

S/075/62/017/001/002/003
B106/B101

55300

AUTHORS: Dobrolyubskaya, T. S., Davydov, A. V., and Nemodruk, A. A.

TITLE: Use of sodium trimetaphosphate to determine uranium by its luminescence in solutions

PERIODICAL: Zhurnal analiticheskoy khimii, v. 17, no. 1, 1962, 70-74

TEXT: A method worked out before by the authors (Zh. analit. khimii 16, 68 (1961)) for the quantitative uranium determination by its luminescence in phosphoric acid solutions was greatly improved by replacing the phosphoric acid by sodium trimetaphosphate. To clarify the composition of the luminescent compound, the dependence of the luminescence intensity of hexavalent uranium on the structure of various condensed phosphates was studied. Intensive luminescence in the presence of uranium was only observed with sodium trimetaphosphate. The preparation was made by 1 hr heating of $\text{NaH}_2\text{PO}_4 \cdot 2\text{H}_2\text{O}$ with uranium nitrate ($1 \cdot 10^{-4}$ g of uranium per 1 g of phosphate) to 525°C . After cooling down, a glassy substance formed which showed intensive green luminescence in ultraviolet light ($\lambda = 253.7$

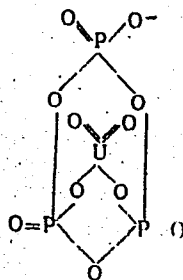
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B106/B101

Use of sodium trimetaphosphate to...

and 365 mμ). Aqueous sodium trimetaphosphate solutions activated with uranium also showed intense luminescence. At room temperature, the luminescence spectrum of uranium-activated sodium trimetaphosphate agreed with the spectrum of uranyl nitrate solution in 5 % phosphoric acid. By the method of isomolar series it was found that uranium reacted with the trimetaphosphate ion during the formation of the luminescent compound at the ratio of 1:1. The structural formula



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is suggested for the luminescent compound. Luminescence increases with increasing uranium concentration in 0.1 % sodium trimetaphosphate solution due to the increase of $[\text{UO}_2(\text{PO}_3)_3]^-$ in the solution. With

$\sim 2.4 \cdot 10^{-4}$ g of U/ml, luminescence reaches a maximum, and decreases again with a further increase in U concentration. With a concentration of

$\sim 1 \cdot 10^{-3}$ g of U/ml, a precipitate falls out in the form of a pale-yellow turbidity. The elementary analysis of the precipitate yielded the

formula $\text{UO}_2[\text{UO}_2(\text{PO}_3)_3]_2$. The identity of the luminescence spectra of

hexavalent uranium in 5 % phosphoric acid and in 0.1 % sodium trimetaphosphate solution suggests that also in phosphoric acid solutions the

uranium luminescence was due to the formation of the $[\text{UO}_2(\text{PO}_3)_3]^-$ complex. X

The decrease in luminescence with increasing uranium concentration as from

$\sim 2.4 \cdot 10^{-4}$ g of U/ml is associated with the formation of poorly soluble

$\text{UO}_2[\text{UO}_2(\text{PO}_3)_3]_2$. An increase of the sodium trimetaphosphate concentration

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initially causes a rapid increase in luminescence which remains practically constant from a certain value. The luminescence intensity of uranium in a sodium trimetaphosphate solution has an optimum at pH ~5 and 20°C and decreases as the temperature rises. The results obtained were used for working out a method for quantitative U determination by its luminescence in 0.1 % Na trimetaphosphate solution. Uranium is separated from the extinguishing impurities by extraction with a tributyl phosphate solution in carbon tetrachloride, calcium nitrate being used as salting-out agent. Uranium is re-extracted with 0.1 % Na trimetaphosphate solution. This method is 15 % more sensitive than the U determination in 5 % phosphoric acid; consumption of Na trimetaphosphate is only 1/50 of that of phosphoric acid. By the method described, U concentrations up to 0.05 µ/ml can be determined in an ЭФ-3 (EF-3) electronic fluorometer. The method was tested on synthetic mixtures (0.10-5.0 µ of U/ml; 100 µ of Fe(III)/ml, 100 µ of Cu/ml, 20 µ of Ni/ml) and on pure, aqueous uranyl nitrate solutions. Results were in good agreement. The error did not exceed ± 7 %. The luminescent reaction of U with Na trimetaphosphate is one of the most sensitive reactions for detecting U directly in aqueous solutions. A paper by E. Thilo (Zh. priklad. khimii 29, 1621 (1956)) is

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33761

S/075/62/017/001/002/003

B106/B101

Use of sodium trimetaphosphate to...

mentioned. There are 6 figures, 1 table, and 3 references: 2 Soviet and 1 non-Soviet. The reference to the English-language publication reads as follows: Sill C., Peterson H., Anal. Chem. 19, 646 (1947).

ASSOCIATION: Institut geokhimii i analiticheskoy khimii im. V. I. Vernadskogo AN SSSR, Moskva (Institute of Geochemistry and Analytical Chemistry imeni V. I. Vernadskiy of the AS USSR, Moscow)

SUBMITTED: November 15, 1960

Card 5/5

DAVIDOV, A. V., BIZINA, G. YE., BEDA, A. G., and BURGOV, N. A.,

"Resonance Absorption Experiments with the 63 sec Ag^{107} Isomeric State,"

report presented at the 3rd Intl. Conf. on the Mossbauer Effect, Cornell Univ.,
New York, 4-7 Sep 63

PALEY, P.N.; NEMODRUK, A.A.; DAVYDOV, A.V.

Automatic extraction-photometric method for the determination of
uranium. Trudy Kom.anal.khim. 14:281-291 '63. (MIRA 16:11)

DAVYDOV, A.V.

L 17858-63 EPR/EWP(j)/EWT(l)/EWT(m)/EPF(c)/BDS AFFTC/ASD/ESD-3/IJP(C)
 ACCESSION NR: AP3003689 Ps-l/Pc-l/Pr-l RM/WW B/0048/63/027/007/0875/0877

AUTHOR: Davy*dov, A.V.; Selyutin, V.P.

TITLE: Angular distribution of mossbauer 100.09 keV gamma-rays from W sup 182
 /Report of the Thirteenth Annual Conference on Nuclear Spectroscopy held in
 Kiev from 25 January to 2 February 1963/

SOURCE: AN SSSR. Izv.Seriya fizicheskaya, v.27, no.7, 1963, 875-877

TOPIC TAGS: Mossbauer effect, gyromagnetic ratio, W sup 182

ABSTRACT: The angular distribution of resonance scatterer γ -rays is often characterized by great anisotropy; this usually exceeds the anisotropy of the angular correlations of γ -rays emitted incident to cascade transitions. This has been utilized for determining the g factors and, consequently, the magnetic moments of excited nuclear states. The present experiments were undertaken to determine the possibility of utilizing the Mossbauer effect for determining g factors by the method of observing the influence of an external magnetic field on the angular distribution of resonance scattered γ -rays. The angular distributions were recorded for the 100.09 keV γ -rays emitted by W¹⁸² (transition from the lowest excited state to the ground state), using the arrangement shown in Fig.1 of the Enclosure.

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ACCESSION NR: AP3003689

Measurements were carried out for stationary and moving sources and scattering angles of 90, 112, 127, 140.5 and 150°. The experimental points fall on the theoretical curve calculated by S.P. Lloyd (Phys.Rev., 83, 716, 1951) for radiation associated with transitions from a spin 2 state to a spin 0 ground state. Thus, it may be asserted that by using fields with a strength over 20 000 Oe one can measure the g factors of excited states of nuclei for which the Mossbauer effect is evinced as strongly as in the case of ^{182}W with an accuracy of 10%, provided the lifetime of the excited state is about 10^{-9} sec, the magnetic moment equals about 0.8 nuclear magnetons and the angular distribution of the scattered radiation is as anisotropic as in the investigated case. "The authors express their deep gratitude to their colleagues at the ITEP, A.I. Zubkov and R.S. Zinatulin, who participated in the measurements, and G.V. Rotter and K.N. Rostovtsev, who carried out some mechanical tasks." Orig.art.hns: 3 figures.

ASSOCIATION: Institut teoreticheskoy i eksperimental'noy fiziki Goskomiteta po mirnomu ispol'zovaniyu atomnoy energii SSSR (Institute of Theoretical and Experimental Physics, State Committee on Peaceful Uses of Atomic Energy, SSSR)

SUBMITTED: 00

DATE ACQ: 02Aug63

ENCL: 01

SUB CODE: PH
Card 2/3

NO REF SOV: 000

OTHER: 003

BIZINA, G.Ye.; BEDA, A.G.; BURGOV, N.A.; DAVYDOV, A.V.

Experiments on the resonance excitation of an isomer state in
Ag¹⁰⁷ with a mean lifetime of 63 seconds. Zhur. eksp. i teor.
fiz. 45 no.5:1408-1413 N '63. (MIRA 17:1)

BJZINA, G. Ye.; BEDA, A. G.; BURGOV, N. A.; DAVYDOV, A. V.

"Resonance Excitation of the Isomeric State of Ag^{107} with Mean Life 63 sec."

report submitted for All-Union Conf on Nuclear Spectroscopy, Tbilisi, 14-22 Feb 64.

ITEF (Inst Theoretical & Experimental Physics)

KARTASHOV, G. R.; BURGOV, N. A.; DAVIDOV, A. V.

"Investigations of the Form of Interaction for Beta Decay of Ne^{23} ."

report submitted for All-Union Conf on Nuclear Spectroscopy, Tbilisi, 14-22
Feb 64.

ITEF (Inst Theoretical & Experimental Physics)

BISINA, G. Ye.; BEDA, A. G.; BURGOV, N. A.; DAVYDOV, A. V., Moscow

"The experiments on resonant excitation of the isomeric state of Ag^{107} with mean life time 63 sec."

report submitted for Intl Conf on Low & Medium Energies Nuclear Physics, Paris, 2-8 Jul 64.

L 52004-65 ENT(m) Feb DIAAP

ACCESSION NR: AT5012688

UR/2513/65/015/000/0368/0374

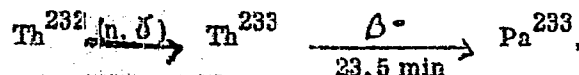
AUTHOR: Davydov, A.V.; Paley, P.N. (Professor, Doctor of chemical sciences) 9
8
B+1

TITLE: Concentration of protactinium-233 from neutron-irradiated thorium on silica gel

SOURCE: AN SSSR. Komissiya po analiticheskoy khimii. Trudy, v. 15, 1965. Metody kontsentriruyaiya veshchestv v analiticheskoy khimii (Methods of concentrating substances in analytical chemistry), 368-374

TOPIC TAGS: protactinium concentration, protactinium production, neutron bombardment, thorium irradiation, silica gel, hydrogen peroxide

ABSTRACT: The article describes a rapid laboratory method of separating protactinium-233 formed by the reaction



using a column of silica gel. Experiments on the sorption of protactinium and thorium were carried out under static and dynamic conditions; 6 M HNO₃ was used for the separation of Pa²³³. Thorium is not adsorbed from nitric acid at this concentration, so that protactinium can be separated from it. The elution of the fission elements Zr⁹⁵,

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ACCESSION NR: AT5012688

Nb⁹⁵, Ce¹⁴⁴ and Ru¹⁰⁶ under dynamic conditions was satisfactory. Solutions of complex-forming substances-oxalic, citric, trihydroxyglutaric, tartaric, and lactic acid — as well as solutions of phosphoric acid and hydrogen peroxide were compared in the desorption of protactinium. Hydrogen peroxide was found to have several advantages. The yield of protactinium was approximately 95%. Orig. art. has: 7 figures and 2 tables.

ASSOCIATION: Komissiya po analiticheskoy khimii, AN SSSR (Commission on Analytical Chemistry, AN SSSR)

SUBMITTED: 00

ENCL: 00

SUB CODE: IC, NP

NO REF SOV: 000

OTHER: 001

858
Card 2/2

DAVYDOV, A.V.; MYASOYEDOV, B.F.; NOVIKOV, Yu.P.; PALEY, P.N.; PAL'SHIN, Ye.S.

Concentration and purification of Pa^{231} and Pa^{233} . Trudy Kom. anal.
khim. 15:64-79 '65. (MIRA 18:7)

KRETOV, A.Ye.; DAVYDOV, A.V.

New method of synthesizing guanamines containing flucroalkyl radicals. Zhur. ob. khim. 35 no.4:746-748 Ap '65.

(MIRA 18:5)

1. Dnepropetrovskiy khimiko-tehnologicheskii institut.

KRETOV, A.Ye. [deceased]; DAVYDOV, A.V.

Study of the reaction of fluorocarboxylic acids with biguanide.
Zhur. ob. khim. 35 no.7:1156-1158 J1 '65. (RUSA 18:8)

1. Dnepropetrovskiy khimiko-tekhnologicheskii Institut.

KRETOV, A.Ye. [deceased]; DAVYDOV, A.V.

S-triazines. Part 3: Cyanoethylation of guanamines containing
fluoroalkyl radicals. Zhur.ob.khim. 35 no.12:2155-2159 D '65.
(MIRA 19:1)

1. Dnepropetrovskiy khimiko-tekhnologicheskii institut. Submitted December 15, 1964.